

Expedited Procedure Under 37 CFR §1.116

Application No. 10/587,741

Paper Dated: October 27, 2010

In Reply to USPTO Correspondence of July 27, 2010

Attorney Docket No. 5503-061852

REMARKS

Claims 27-33 remain in this application. Claims 27-32 have been amended. Claims 1-26 have been cancelled. No new subject matter is believed to have been added by this Amendment.

In Section No. 1 of the Office Action, the Examiner, under 37 C.F.R. §1.75(d) objects to claims 31-33 as being of improper dependent form. Claims 31-33 have been amended to address this concern.

In Section No. 2 of the Office Action, the Examiner objects to claims 28 and 31-33 for certain informalities. These claims have been amended to address these informalities.

In Section No. 4 of the Office Action, the Examiner rejects claims 27-33 under 35 U.S.C. §112, second paragraph, as being indefinite. Multiple examples are cited in Section No. 4 and each of these examples has been addressed through amendments to the claims.

In Section No. 7 of the Office Action, the Examiner rejects claims 27-29, 31, and 32 under 35 U.S.C. §103(a) as being obvious from the teaching of United States Patent No. 6,116,035 to Tanaka, et al. (hereinafter the "Tanaka patent") in view of the teaching of United States Patent No. 6,425,262 to Pomme (hereinafter the "Pomme patent").

With regard to the Tanaka patent, the Examiner refers to Fig. 45 and explains that the Tanaka patent discloses a refrigeration plant and operating method, which comprises in a refrigeration circuit (A), a compressor (11), a condenser (14), an injection valve (18b), and an evaporator (heat exchangers 2, 15), which is passed through on its secondary side (2) by a secondary medium (via refrigerant circuit B) to be cooled down, whereby a heat exchanger (1, 12) is provided between a feed line (the line at the bottom of heat exchanger 2) for the secondary medium and a refrigerant line leading to said injection valve (the line at the top of heat exchanger 15).

However, as can be seen from Fig. 45, the heat exchanger (1, 12) is not arranged in a refrigerant line leading to the injection valve (18b) of the refrigeration circuit (A), but it is arranged in the refrigerant line leading to a different injection valve (18a). Accordingly, this heat exchanger (1, 12) is by no means able to keep the temperature of the refrigerant at the entrance of injection valve (18b) constant.

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As explained in the Tanaka patent (column 64, lines 23 to 51), item (17) denotes only a bypass passage with a heat amount adjusting heat exchanger (14). The main primary refrigerant circuit (A) comprises a compressor (11), a condenser (12), an expansion valve (18a), and an evaporator (15). Accordingly, there is no means between the condenser (12) and the expansion valve (18a), which is passed by a secondary medium to keep the temperature at the entrance of the injection valve (18a) constant, as in claim 27 and 31 of the present application.

The Pomme patent, on the other hand, as illustrated in Fig. 3 of the Pomme patent, teaches a completely different air conditioning circuit. The central part of the circuit, which is a so-called preliminary pressure reduction device (4), is positioned in the refrigeration circuit between the condenser (3) and a vessel (5).

The Pomme patent explains (column 1, lines 42-55): *In conventional liquid coolant loops, the coolant passes through the separating vessel at point E of the thermodynamic cycle, and passes through segment EG in the pressure reducing valve. As point E is situated in the liquid zone, the vessel is then completely filled with liquid and the quantity of coolant which it contains cannot vary.*

When the total mass of the liquid coolant contained in the loop falls, especially by virtue of leaks in the circuit, this reduction is performed in particular at the expense of the condenser, the undercooling capacity of which is thus reduced, which has the effect of raising the enthalpy level of the coolant at the outlet of the condenser and at the inlet of the evaporator and consequently of reducing the useful heat absorbed by the coolant in the evaporator.

The Pomme patent then states (column 3, lines 56-60): *For the conventional loop mentioned above, in which the thermodynamic state of the fluid in the separating vessel corresponds to point E of the cycle, the plateau of the curve of Fig. 2 does not exist and the degree of undercooling varies continuously with the quantity of coolant.*

Thus, according to the Pomme patent, the continuous variation of the degree of undercooling is avoided by using the aforementioned preliminary pressure reduction device 4.

This means that combining the teachings of the Tanaka patent and the Pomme patent would result in a refrigeration circuit according to Fig. 45 of the Tanaka patent with an additional separating vessel and a preliminary pressure reduction device positioned at the

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entrance of said vessel at a position between the heat exchanger (1, 12) and the expansion valve (18a), unlike the invention as found in claims 27 and 31 of the present application.

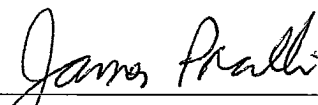
For these reasons, method claim 27 and apparatus claim 31 are believed to be patentably distinct over the teaching of the Tanaka patent in view of the teaching of the Pomme patent. By way of their dependence upon what are believed to be patentably distinct claims 27 and 31, dependent claims 28-29 and 32-33 are themselves believed to be patentably distinct over the teaching of the Tagawa patent alone or in combination with the teaching of the Pomme patent.

In Section No. 8 of the Office Action, the Examiner rejects claims 29, 30, and 33 under 35 U.S.C. §103(a) as being obvious from the teaching of the Tagawa patent in view of the teaching of the Pomme patent, and further in view of the teaching of United States Patent No. 7,574,874 to Aflekt, et. al. By way of their dependence upon what are believed to be patentably distinct claims 27 and 31, dependent claims 29, 30 and 33 are themselves believed to be patentably distinct over the teaching of these references.

Reconsideration and allowance of pending claims 27-33 are hereby respectfully requested.

Respectfully submitted,

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